NOTES.

THE Woolwich Examinations question, to the importance of which we again direct attention in our first article to-day, is not to be allowed to lapse. Three or four Members of Parliament who are interested in science mean to press the Government for some rational change in the rules.

IN accordance with the rule which empowers the election of nine persons annually "of distinguished eminence in science, literature, or the arts, or for public services," Dr. Lauder Brunton, F.R.S., has been elected a member of the Athenæum Club.

THE extraordinary interest and value of the botanical collections made by Signor Odoardo Beccari during a residence of several years in the Malay Archipelago, and especially in Borneo, are well known to naturalists. For some time past Signor Beccari has been occupied at Florence with the publication of his results in the work with which botanists, whether systematists or morphologists, are familiar under the name of *Malesia.* Owing to the threatened withdrawal of the modest support which the Italian Government have extended to this publication (his collections having been acquired by the State), there is some reason to fear that it may come to an abrupt termination. Under these circumstances the Bentham Trustees have placed at Signor Beccari's disposal the sum of 1000 francs, which they were informed would secure the continuance of the work for one year. In accepting this support Signor Beccari has informed the Trustees that he hesitates the less to do so as it affords the strongest possible proof of the estimation in which his labours are held in the botanical world generally.

PROF. ISAAC BAYLEY BALFOUR, of the University of Oxford, has been elected Professor of Botany at the University of Edinburgh in the room of the late Prof. Dickson. Prof. Bayley Balfour is the son of the late Prof. Balfour, Prof. Dickson's predecessor in the Chair.

M. T. RIBOT has been appointed to the new Chair of Experimental and Comparative Psychology, founded by the Paris Municipal Council at the Collège de France.

DR. F. L. PATTON succeeds Dr. McCosh as the President of Princeton College. *Science* says :—" Dr. Patton is still a young man, being but forty-five years of age, and has yet to put forth to their fullest extent his marvellous intellectual powers. We seriously question whether any College has a President of so high an intellectual stamp as Dr. Patton."

MR. GRIESBACH, the well-known geologist to the Afghan Boundary Commission, and Deputy-Superintendent of the Geological Survey of India, has been permitted to take employment under the Ameer of Afghanistan for the purpose of developing the mineral resources of the country.

MR. H. O. FORBES has just arrived in England from New Guinea. Mr. Forbes succeeded in reaching the foot of the Owen Stanley range, after the very greatest difficulties owing to the broken nature of the country. When he returned to his camp to make the necessary arrangements for ascending the range, he found it had been attacked and his people dispersed by the natives. He had the greatest difficulty in reaching the coast, and narrowly escaped with his life.

M. EDOUARD DUPONT, Director of the Brussels Natural History Museum, has just returned to Belgium, after an absence of eight months for the purpose of visiting the Congo. M. Dupont has made a very careful study of the region between the coast and the mouth of the Kassai, with a special view to its geology and natural history. The detailed results he will shortly communicate to the Brussels Societies.

THE Rev. W. H. Dallinger, F.R.S., will on Thursday next (March 8) begin a course of three lectures at the Royal Institution, on microscopical work with recent lenses on the least and simplest forms of life.

THE *Times* understands that King's and University Colleges have been informed that the Privy Council will hear them at some date after April 16 next in support of their joint petition for incorporation as the nucleus of a Teaching University for London. The Privy Council have further desired that, as the petition of the two Colleges appears to be substantially at one with that of the Teaching University Association, the Colleges should present a joint case with that Association not later than March 31.

A DEPUTATION from the School Boards of England and Wales had an interview last week with Lord Cranbrook and Sir W. Hart Dyke, to press upon their attention some considerations with regard to technical instruction. In the course of his reply to the various statements made, Lord Cranbrook said that the Technical Instruction Bill would be introduced as soon as possible. The Government, he assured the deputation, fully intended, if possible, to pass the measure, and he ventured to ask those who were interested in it, if they did not get all that they required, to be content with a beginning, and not be too anxious to press extreme conclusions which might raise opposition that did not at present exist.

M. PASTEUR, having entered the lists as a competitor for the reward of £25,000 offered by the Government of New South Wales for exterminating the superabundant rabbits, has sent three delegates with a supply of "*microbes du choléra des poules*," with which he hopes to win the prize. Whatever may be thought of this particular remedy, there can be no doubt as to the serious nature of the plague of rabbits in Australia. During last August the rabbit inspectors travelled 20,202 miles and destroyed 2,069,128 rabbit scalps, and from January 1 to August 1 they destroyed 10,538,778 rabbit scalps. The New South Wales Parliament lately provided funds for the making of a rabbit-proof fence from Bourke to the Queensland border.

THE earthquake which caused so much alarm at Grenada on the 10th ult. was felt in many parts of the West Indies. There were oscillations at Barbados, St. Lucia, St. Vincent, Grenada, Demerara, and Trinidad, and it is said that in many places much damage was done to house property. The earthquake was also felt on the other side of the Gulf of Paria. In Guiria three houses were destroyed and the earth opened in chasms and closed again. At Yrapa the shock was so severe that a terrified old woman threw herself into the sea and was drowned.

ABOUT midnight on January 15 a shock of earthquake was felt by a party of five persons on the road four kilometres west of Trysil Church in Central Norway. The shock was accompanied by a dull rumbling noise like that of a heavy cart passing across a bridge.

ON the night of January 5 showers of ashes fell in certain parts of Elverum in Central Norway, in some places making the snow quite gray. It is surmised that the fall may have been connected with some volcanic eruption in Iceland, as has formerly been the case in this locality.

ACCORDING to the *Panama Star and Herald* a huge wave lately struck the beach at Baraçoa, Cuba. After sweeping in fully 400 feet, it flowed back to the ocean. Nearly 300 huts and houses are said to have been destroyed, but no lives were lost, for the people saw the wave coming and fled to the hills. The beach was swept clear of every habitation that stood upon it. The wave was not a tidal wave, but the result of a three days' north wind.

M. L. Teisserenc de Bort discusses, in the *Annales* of the French Central Meteorological Office for 1885, part iv. (Paris, 1887), the importance of the high barometric pressures of Asia for weather forecasts over Europe. The paper deals with various types of isobars existing simultaneously over Asia and Europe, illustrated by charts. The result arrived at is that European offices would derive great advantage from daily telegrams from Asia, especially from the stations already in existence in Siberia which report to St. Petersburg by wire. Hitherto the idea has generally prevailed that the movements of the atmosphere from the westward were alone useful for the prediction of weather changes over Europe.

The Austrian Meteorological Office has just published its *Jahrbuch* for 1886. The service was established in 1847, and the first volume contained observations for 1848–49. The new series of volumes, of which the present is the twenty-third, began with the year 1864. The stations now number 380, including three abroad, and are closer together than in any other of the larger systems; there are no less than nine stations in Vienna alone. Daily observations are published for eighteen stations; for all the others monthly and yearly *résumés* are given. The Hungarian observations are published in a separate volume.

The *Pioneer* of Allahabad mentions a circumstance connected with two recent cyclonic storms which is worthy of the attention of meteorologists. These storms struck the Scinde desert between January 24 and 30, and passed in a straight line across the continent to Cuttack at the rate of 250 to 300 miles daily. The second continued unbroken across the Bay of Bengal to Burmah. If the line they followed were prolonged straight westward it would reach Vienna, which is about 3600 miles from Scinde. There seems (says the *Pioneer*) to have been an unusually violent atmospheric disturbance in Vienna in the early part of January, so the time and the rate of travelling would agree with the assumption that the storms were identical with that disturbance.

Two remarkable new fluorides of potassium have been discovered by M. Moissan, the isolater of fluorine. Hydrofluoric acid is well-known to be readily capable of combining with neutral fluorides to form fluorhydrates similar to that of potassium, $KF . HF$; indeed it was by the use of this latter compound that fluorine was eventually so successfully obtained in the free state. Moreover, the formation of such compounds has been completely accounted for by the vapour-density determinations of Kletzinsky and Mallet, who have shown that the composition of the molecule of hydrofluoric acid just above its boiling-point is H_2F_2. But M. Moissan now shows that this double fluoride of potassium is by no means the only one, that two others, $KF . 2HF$ and $KF . 3HF$ may be readily obtained in well-formed crystals. When dry powdered $KF . HF$ is placed in anhydrous hydrofluoric acid, it disappears almost instantaneously, the liquid becoming sensibly warm; in fact, M. Moissan in a few moments dissolved five to six grammes in ten grammes of the acid. On cooling this mixture to $-23°$ C. white crystals separated out; these were rapidly dried between filter paper, transferred to a platinum tube closed by a paraffined cork, weighed and analyzed. The results of the analyses indicated the composition $KF . 3HF$. The compound was then synthetically prepared by mixing potassium fluoride and the acid in these proportions, evading any sudden rise of temperature; the liquid was subsequently warmed to 85° in a platinum capsule, but not a trace of hydrofluoric acid vapour escaped, although that substance boils at 19°. Hence it was evident that the HF was locked up in chemical combination, and this was soon observed to be the case, for on removing the source of heat, crystals began to form even while the thermometer indicated 68°; on resuming the ordinary temperature of the room, the whole became a mass of interlaced crystals, which analysis proved to be those of $KF . 3HF$. These crystals are extremely deliquescent, being decomposed by water into the free acid and potassium fluoride, emitting the acid fumes in a humid atmosphere, and dissolving in water with production of the most intense cold. If they are suddenly heated with crystalline silicon, the mass becomes incandescent, and a violent disengagement of silicon tetrafluoride gas occurs. The stability of this fluorhydrate was strikingly shown by placing a few crystals *in vacuo*, when even after two hours the manometer only showed a difference of 0·01 m. In a somewhat similar manner the compound $KF . 2HF$ was isolated and found to be a liquid at 105°, but crystallizing in the cold. It is to the formation of these fluorhydrates that M. Moissan attributes the preservation of his fluorine-isolating apparatus, and the regular evolution of gaseous fluorine during the electrolysis.

During the last two or three years an extensive search for natural gas has been made in the United States. In a paper on the subject, just issued by the U.S. Geological Survey, Mr. J. D. Weeks says the results of this exploration indicate:—(1) That along the Atlantic coast, east of the Appalachian Chain, including in this term the Green Mountains, no gas is found, or, if found at all, in such small quantities as to indicate that it is of comparatively recent origin. It is also found in such horizons, and under such conditions, as to give but little evidence that it is in such storage reservoirs as to promise any considerable supply. (2) That the chief sources of the supply of natural gas in the United States are to be found in the Mississippi Valley, and, so far as present explorations show, in that portion of it east of the Mississippi River. The chief localities that had assumed any prominence as gas-centres at the close of 1886 were in South-Western New York, Western Pennsylvania, North-Western Ohio, and Central Eastern Indiana. To these may be added a locality in Michigan and one in Eastern Kansas.

In the report of the U.S. Commission of Education for the year 1885–86, just issued, it is stated that seldom in the history of the United States have superior institutions of learning occupied so large a share of public attention or given signs of such vigorous and fruitful life as at the present time. Among these institutions are classed schools of science, pure and applied, which, according to the writer of the report, "have greatly increased the provision for superior instruction, extended its province, and borne an important part in the adjustment of its processes to the demands arising from the extraordinary increase of scientific knowledge and its applications to the leading industries of modern times."

We have received the annual address to the Asiatic Society, Calcutta, delivered by the President, Mr. E. T. Atkinson. Speaking of the Survey of India, Mr. Atkinson says that most of the operations connected with it during the past year have been devoted to remunerative as distinguished from purely scientific investigation. In many districts the survey has been cadastral with a record of rights. The Baluchistan parties have done a considerable amount of large-scale work around Quetta and towards the Khwajah Amran range, and are now engaged on the half-inch survey of that province. The Himalayan party has been working under Colonel Tanner towards Kulu, and the Andaman party has completed the survey of the coasts of the Nicobars.

We have received the "Geological Record for 1879," containing an account of works on geology, mineralogy, and palæontology, published during the year, with supplements for 1874–78. The volume is edited by Mr. Whitaker and Mr. W. H. Dalton, and published by Messrs. Taylor and Francis. In the preface Mr. Whitaker explains that as the position of editor of the "Geological Record" has proved to be one that can be held only with great difficulty by a busy man who does not live in London, it has been taken over by Mr. Topley. The "Record" is to be brought up to date by giving the titles only of papers, &c., for the years 1880 to 1887. The portion for 1880 to 1884 is finished, and in great part printed; and so large is the amount of geological literature that in this contracted form (without abstracts) two volumes will be needed for the five years.

RECENT Shanghai papers contain the report of the "Chinese Scientific Book Depot," an institution which was established three years ago for the purpose of facilitating the spread of all useful literature in the native language throughout China, and especially of books, maps, and other publications of a scientific or technical character. It does not publish works, but has merely organized a system by which the translations and compilations on scientific subjects issued by the various Departments of the Chinese central and local Governments, by missionary and other philanthropic Societies, are more widely distributed amongst the Chinese people. The demand for such books is fast increasing, and the establishment of the central depot, with branches at the more important cities, suggested itself three years since. Self-support has been the motto of the institution, and, in order to overcome Chinese prejudices, everything smacking of foreign influence has been eliminated as far as possible. During the second year a branch was opened at Tientsin, and subsequently Hangchow, Swatow, Pekin, Hankow, Foochow, and Amoy were similarly provided. During the three years about £2500 worth of books, maps, &c., have been sold, some of them finding their way to the most distant parts of China, Corea, and Japan. Taking the average price per volume at 4*d.* to 5*d.*, this would give a circulation of about 150,000 volumes of useful literature, chiefly of a scientific and educational character. The shops have also served to some extent as reading-rooms, where inquirers after Western knowledge have been able to sit down and examine any works in which they felt interested. The number of scientific and other treatises already translated or compiled and published in Chinese under foreign management amounts at present to over 200. To these have been added about 250 of the most useful native works, including scientific treatises by the early Jesuit fathers.

SIR EDWARD BIRKBECK, President of the National Sea Fisheries Protection Association, is now promoting in Parliament a Bill, the object of which is to secure reasonably cheap and rapid transport for common kinds of sea fish, in quantities of 1 cwt. and upwards, from the coast to the various inland centres of population, and thus, by securing a plentiful distribution, to render an inestimable benefit alike to the poor of our inland towns and villages and the fishermen of our coast. The Bill does not attempt to interfere with the rates now charged by railway companies for prime fish, nor with quantities of less than 1 cwt. of common fish. Sir Edward Birkbeck should have no great difficulty in securing sufficient support for so moderate and good a measure.

DR. F. NANSEN, of the Bergen Museum, Norway, who thinks of journeying across Greenland next summer from east to west, intends to land on the east coast at Cape Dan (66° N.), and proceed in a north-westerly direction to Disco Bay. He will be accompanied by three men—a Norwegian soldier well known for his prowess on *Ski*, or snow-runners, and two Lapps, probably the same who accompanied Nordenskiöld. In order to qualify himself for the contemplated task, Dr. Nansen is preparing to travel on *Ski* from Bergen to Christiania, right across the mountains of Central Norway, a feat never before accomplished by anyone.

THE additions to the Zoological Society's Gardens during the past week include an African Civet Cat (*Viverra civetta*) from South Africa, presented by Capt. Webster, R.M.S. *Hawarden Castle;* three Barred Doves (*Geopelia striata*) from Batavia, Java, presented by Mrs. G. A. Thomson; a Cape Crowned Crane (*Balearica chrysopelargus*) from South Africa; a Gold Pheasant (*Thaumalea picta*) from China, deposited; a Common Wolf (*Canis lupus* ♀) European, received in exchange; two Red Kangaroos (*Macropus rufus*), two Suricates (*Suricata tetradactyla*) born in the Gardens.

OUR ASTRONOMICAL COLUMN.

SOLAR ACTIVITY IN 1887.—The decline in the three orders of solar phenomena, spots, faculæ, and prominences which had been so marked during 1886, and particularly during the latter part of that year, continued in 1887, and although there was no spotless period so long continued as that of November 1886 (see NATURE, vol. xxxv. p. 445), the mean spotted area for the year just passed has been much below that for the year preceding it, and faculæ and prominences have shown a similar falling off. During the first four months of 1887, sunspots were both few and small, and there were several intervals of a week or longer in which no spots were seen at all; January 9–18, February 7–16, March 3–9, April 4–11, being such intervals. There was also very little on the sun from March 10–15, and from March 27 to April 18. But after this a revival set in and a fine group of spots was seen on the sun, May 14–23, appearing again in the three following rotations, June 5–18, July 3–14, and July 30–August 9. The days of greatest spotted area during the year were July 6, 7, and 8, but after this the spots began to decrease again, and were few and small in September, October, and November. August 23 to September 12 was a very quiet period, spots only being seen on about four days; and October 6–17, October 28 to November 4, and November 21 to December 1, were spotless intervals. The last month of the year, however, showed a second rally, a fine group of spots being observed during its first fortnight, and another appearing as the first passed off at the west limb. On the whole the mean daily spotted area for 1887 was about two-fifths of that which it was for 1886. Comparing the results for 1885, 1886, and 1887, with the years preceding the last minimum, 1885 shows a somewhat greater mean daily spotted area than 1874, 1886 than 1875, and 1887 than 1876. If, therefore, the decline continues to proceed as during the last cycle, the next minimum will fall early in 1890.

The following figures, taken from Prof. Tacchini's tables, as given in the *Comptes rendus*, may be compared with those given for 1885 and 1886 (NATURE, vol. xxxiii. p. 398, and xxxv. p. 445):—

	Sunspots.			Faculæ.
	Relative Frequence.	Relative Size.	Mean Daily Number of Groups.	Relative Size.
January	2·87	9·35	1·17	11·52
February	3·35	7·83	1·32	10·09
March	1·00	3·35	0·42	16·00
April	1·12	7·76	0·68	6·80
May	4·18	22·04	1·11	9·29
June	4·15	29·74	1·37	20·37
July	5·07	25·25	1·68	14·11
August	4·60	23·53	1·32	14·29
September	2·47	15·75	0·56	9·23
October	1·27	20·21	0·70	10·53
November	1·70	6·41	0·71	17·30
December	6·68	40·10	1·21	16·84

In general accord with the above figures are Wolf's "relative numbers." These are given below for 1886 and 1887, together with the monthly means of the variations in magnetic declination as observed at Milan. The agreement in the general form of the curves for spot numbers and magnetic variation has not been so close in 1887 as in some previous years, nor is the calculated mean value for the magnetic variation so near the observed as in 1885 and 1886; the values calculated by M. Wolf's formula being 6′·79 for 1886, and 6′·21 for 1887, but the observed being 6′·72 and 6′·61.